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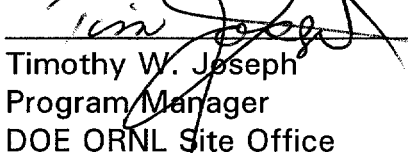
The enclosed is to fulfill a request made by Chem Risk, as part of the *Oak Ridge Health Studies agreement* efforts. These documents have received the necessary reviews and may be released to the Chem Risk.

TIO Release Approval: David E. Hamrin

Information enclosed: Ornl waste entering poplar creek.

Requested by: ChemRisk

Requested from: Joe Weaver

Approved:   
Timothy W. Joseph  
Program Manager  
DOE ORNL Site Office

Date: December 13, 1995

cc w/o enc: J. L. Weaver, 101MID, MS-6481

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ChemRisk Request ORNL/CHR-951129/2

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# REMARKS

Y-12 Technical Information: *Unlimited (ChemRisk) P.R. McHenry 12/5/95*

Y-12 Classification: *Unclassified T.J. Fraser 11/29/95*

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1. JAS  
2. MRL  
Waste Disposal

**INTER-COMPANY CORRESPONDENCE**

**UNION CARBIDE NUCLEAR COMPANY**

A Division of Union Carbide and Carbon Corporation

To: R. A. Walker

Plant: Oak Ridge National Laboratory

Date: May 31, 1960

Copies To:

M. E. Ramsey ✓  
File

Subject: ORNL Wastes Entering Poplar Creek

Copy Fwd. by MER, 6-2-60  
AFRupp - JHGillette - "We are going to be forced to stop discharges such as those listed to Poplar Creek. We should start correcting this now."  
MER

The following is a summary of the estimated wastes contributed by ORNL to Poplar Creek:

Buildings 9204-3\* and 9731 (Stable Isotopes)

<u>Waste Material</u>	<u>Form</u>	<u>Quantity/Month</u>	<u>Disposal Method</u>
U-238	Sol'n (<1ppm)	~5gm U	<50gal./batch
Nitric Acid	2-3% HNO <sub>3</sub>	1350 gal.	<50gal./batch
Sodium Hydroxide	1.0%	800 gal.	<50gal./batch
Ammonium Bifluoride	0.05%	1200 gal.	<50gal./batch
Soluble Salts	5% HNO <sub>3</sub> Sol'n	6100 gal.	<50gal./batch
Soluble Salts	3% NH <sub>4</sub> OH Sol'n	100 gal.	<50gal./batch

\*These quantities have been adjusted to include expected values that will result from operation of 16 calutrons in Track 5, about September 1, 1960.

Building 9733-1 (Chemistry)

<u>Waste Material</u>	<u>Form</u>	<u>Quantity/Month</u>	<u>Disposal Method</u>
H <sub>2</sub> SO <sub>4</sub>	80% Sol'n	1500 gal.	continuous**
HNO <sub>3</sub>	70% Sol'n	60 gal.	continuous**

\*\*Effluent from column operation for separation of N isotopes fed continuously and evenly to the creek 24 hrs/day and 7 days/week.

Buildings 9733-2,-3,-4

Only analytical laboratory (test-tube) quantities of non-toxic chemicals, including acids and bases, enter the creek from these buildings.

Building 9201-2 (Thermonuclear and Electronuclear Divisions)

Only unpolluted cooling water from various machines and test tube quantities of various non-toxic chemicals from a small analytical lab enter the stream from this building.

May 31, 1960

Building 9201-3 (Reactor Projects Division)

Only unpolluted cooling water from various operating rigs enters the creek from this building. This group also operates the Be Cleaning Facility in 9419-1. The waste from Be cleaning is held in a large concrete tank and evaporation takes care of disposal. (The tank has overflowed to the creek once, and sampling showed less than 1ppm Be in the tank overflow line.)

Building 9204-1 (Reactor Experimental Engineering Division)

Only very small quantities (laboratory, i.e. test tube amounts) of  $H_2SO_4$  and  $HNO_3$  are released to the creek from this building. Loops containing thorium and natural uranium are operated here, and the cooling water is released to the creek. (Ruptures and spills from these loops are cleaned up by mopping, etc.; material is not flushed to the creek.)

Buildings 9207 and 9210 (Biology Division)

Wastes from chemical and biological laboratories in these buildings are discharged to the creek. These wastes include small amounts of acids, bases, and non-toxic chemicals. Survey of the wastes from these buildings is not complete; findings will be forwarded on completion of the survey.

Please let me know if any further information is desired.

Signed E. M. King

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E. M. King

EMK:jl

INTER-COMPANY CORRESPONDENCE

UNION CARBIDE NUCLEAR COMPANY

Division of Union Carbide Corporation

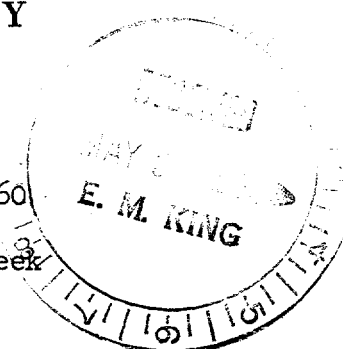
To: Those Listed

Plant: Y-12

Date: May 2, 1960

Copies To:

Subject: Poplar Creek



Recent investigations of the effluent of Poplar Creek from the Y-12 Area have pointed up an acute pollution problem. A program must be initiated to reduce the contamination of this stream. The Chemical Operations Division has been assigned by the Y-12 Plant Superintendent to coordinate the clean up of Poplar Creek. In order to work most efficiently all people concerned should be briefed as completely as possible.

The pH of Poplar Creek is continuously monitored at the east end of the Y-12 Plant. A composite sample of the creek at this point is automatically collected and analyzed. The composite sample has a pH of 6-8 but the continuous monitor shows many sharp fluctuations below 4 each day. These sudden fluctuations result from batch disposal of wastes to the creek and must be eliminated where possible.

In the past any reduction in the amount of contamination in Poplar Creek has been a result of economic and radiation considerations rather than a pollution control program. Although these efforts have been successful to a considerable extent a major pollution problem still exists. It is felt that the majority of people responsible for the contaminating of Poplar Creek are unaware of the pollution problem. The major contaminants are:  $H_2SO_4$ ,  $HNO_3$ ,  $HCl$ ,  $Al$ ,  $Li$ ,  $Hg$ ,  $F$ , carbon dust, coal dust, and various organic chemicals.

It is requested that each division make a detailed study of its current waste disposal practices. The study should include the following:

1. Types and amounts of contaminants.
2. Method of disposal - batch or continuous.
3. Where disposed - creek, burial pit, waste pond at west end of Y-12, etc.

Please investigate any possible methods for your reducing the contamination level of Poplar Creek such as neutralization, filtration, settling, change of disposal location, etc.

Those Listed

- 2 -

May 2, 1960


It might be possible for minor changes to be made in certain operations that would result in less contaminants being discharged to the creek.

If you will advise us of your findings, we will look into the advisability of scheduling disposal and any other means of controlling the contamination which might appear feasible. We would appreciate any suggestions you might have.

*R. A. Walker*  
R. A. Walker

ND:RAW:bfg

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R. A. Walker (Y-12RC)  
W. K. Whitson, Jr.

*Waste Disposal*  
*Annual*

**INTER-COMPANY CORRESPONDENCE**  
**UNION CARBIDE NUCLEAR COMPANY**  
Division of Union Carbide Corporation

To: Mr. J. P. Murray  
Building 9704-2

Plant: Y-12

Date: July 21, 1960

Copies To: Those Listed

Subject: Poplar Creek

A study of current waste disposal practices in the Y-12 Plant has been made. Table I lists the estimated amounts of contaminants which are discharged daily into the east fork of Poplar Creek based on information supplied by the various groups in Y-12. The following major recommendations are proposed to improve the pollution problem of Poplar Creek.

1. Install a new 3-inch SS line from Area 5 to the S-3 pond area located in the west end of the Y-12 Plant. This line is to handle all acid type wastes from Area 5. Estimated cost - \$96,000.
2. Install a nuclear safe raffinate and condensate collection system at Building 9206. Pump these solutions to the new 3-inch line (in proposal 1) for disposal in the S-3 pond. Estimated cost - \$25,000.
3. Utilize the existing SS line from Area 5 to the S-3 pond for the disposal of caustic wastes from Area 5 that are presently discharged into Poplar Creek. The old line would also serve as a spare for the new acid line mentioned in proposal 1.
4. Pump the caustic solution from the Beta-2 chlorine scrubbers to the existing SS disposal line from Area 5 to the S-3 pond. Estimated cost - \$5,000.
5. Construct a concrete settling basin (approximately 25 feet x 40 feet x 5 feet) south of the electroplating shop, Building 9401-2, to collect all wastes from the plating shop except the nickel and cyanide strip solutions. Pipe the caustic scrubber solution from the nitrogen plant and the sulfuric acid regeneration solutions from the steam plant acid softners (without the large quantity of rinse water) to this basin. The effluent from the basin is to be pumped to the new SS line from Area 5 to the S-3 pond. Estimated cost - \$21,000.
6. Pump the sodium chloride regeneration solutions from the sodium softners at the steam plant over the hill through the existing cast iron pipe presently used for sluicing ash wastes from the steam plant. Estimated cost - 0.
7. Install tanks at Building 9202 for collection and interim storage of the ammonia filtrates and acid solutions. Truck these solutions to the S-3 pond. Estimated cost - \$5,000.



July 21, 1960

In addition to these major proposals, several minor proposals are being made to each of the groups individually.

By initiating the seven major proposals the contamination discharged into Poplar Creek will be reduced from approximately 15,200 pounds/day to approximately 1,416 pounds/day (See Table I).

At the present time approximately 5,000 gallons/day of solutions are being pumped to the S-3 pond area. The major proposals on the preceding page will increase this to approximately 20,500 gallons/day and it is probable that the S-3 pond area will have to be enlarged. Two additional ponds can be constructed for an estimated cost of \$25,000.

A summation of the estimated costs are given below.

New 3-inch SS line - Area 5 to S-3 Pond	\$ 96,000
New line from 9206 to Area 5 new line	25,000
New line from 9204-2 to Area 5 existing line	5,000
Concrete retention pond at plating shop and connection to S-3 Pond	21,000
Collection tanks at 9202	<u>5,000</u>
Sub Total	\$152,000
S-3 Pond enlargement	<u>25,000</u>
Total	\$177,000

At the present time there are no specific regulations by the state of Tennessee, Anderson County, or Oak Ridge concerning water quality. The state of Tennessee has only very general requirements. Based on information as supplied by the various groups in Y-12 and in conjunction with information contained in "Water Quality Criteria" published by the State Water Pollution Control Board, Sacramento, California, 1952 and 1954 editions, it is believed that, if the seven major proposals as listed are completed, the additional two ponds are constructed at the S-3 area, and the Y-12 groups follow the program diligently, Poplar Creek will meet all reasonably expected regulations in regard to pollution and contamination that the state of Tennessee, Anderson County, or the city of Oak Ridge may adopt.

  
R. A. Walker

RAW:ND:bfg

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W. E. Heckert R. D. Williams, w/Attach.  
R. F. Hibbs

TABLE I

ESTIMATED CONTAMINANTS DISCHARGED DAILY INTO POPLAR CREEK

<u>Chemical</u>	<u>Present Pounds per Day</u>	<u>Remaining Pounds per Day</u> <sup>1</sup>
HNO <sub>3</sub>	762	150
NaOH	1,362	175
HCl	210	0
H <sub>2</sub> SO <sub>4</sub>	Approx. 1,590	Approx. 390
NaCl	Approx. 7,500	0
NaOCl	2,200	0
LiOH·H <sub>2</sub> O	271	271
Hg	6	6
Misc.	<u>1,304</u>	<u>424</u>
TOTAL	15,205	1,416

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<sup>1</sup> Assuming major proposals 1-7 are completed.

E. M. King

All disposals should be made on as near a continuous basis as possible. It is suggested that you investigate some other method of disposal for the 80%  $\text{H}_2\text{SO}_4$  and the 70%  $\text{HNO}_3$  solutions from Building 9733-1 (i.e., collecting and trucking to S-3 pond, burial, reuse, neutralization).